



achievement TESTING program

Information Bulletin

• Grade 9 Science •

2000 – 2001 School Year

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Grade 9 Science Assessment

General Description

The Grade 9 Science Achievement Test consists of 55 machine-scored questions: 50 multiple-choice questions, each with a value of one mark, and five numerical-response questions, each with a value of one mark. The five numerical-response questions are integrated within the multiple-choice questions.

The test is developed to be completed in 75 minutes; however, students may take an additional 30 minutes to complete the test.

Students require HB pencils and erasers. A calculator is recommended. See the link to *Use of Calculators on Alberta Learning Achievement Tests*. Students record their answers on a separate answer sheet.

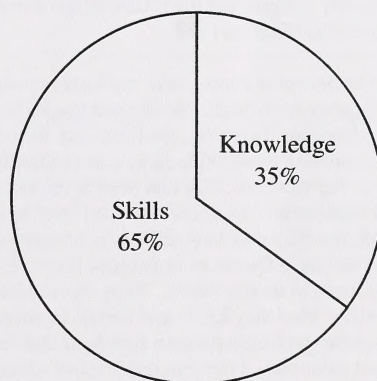
Reporting Categories

This assessment is based on science learnings within which the nature of science, technology, and society are integrated components.

Knowledge and skill components are integrated in the assessment. Knowledge components relate to fundamental understanding of the concepts and the processes of science. Skill components relate to the application of science processes and the use of higher-level thinking to solve problems. The skills reporting category consists of:

- inquiry skills
- technological problem-solving skills
- societal decision-making skills

The following circle graph shows the approximate emphasis for the reporting categories of knowledge and skills.



Questions will have contexts drawn from the following topics.

Diversity of Living Things
Fluids and Pressure
Heat Energy: Transfer and Conservation
Electromagnetic Systems
Chemical Properties and Changes
Environmental Quality

Description of Science Assessment Standards

The following statements describe what is expected of Grade 9 students who are meeting the *acceptable standard* or the *standard of excellence*, based on outcomes in the *Program of Studies*. These statements represent the standards against which student achievement is measured. It is important to remember that one test cannot measure all of the outcomes in the *Program of Studies*.

Acceptable Standard	Standard of Excellence
<p>Students who meet the <i>acceptable standard</i> in Grade 9 Science have a basic understanding of the conceptual and procedural knowledge that is essential to the junior high science program. For example, they can easily apply concepts and basic procedures to simple and familiar situations, but they may be challenged when applying these concepts and procedures to unfamiliar or complex situations. For example, students can identify the name of an organism in a classification system, but they may have difficulty interpreting the relationship of organisms in the same classification level.</p> <p>To meet the <i>acceptable standard</i>, students are expected to know how to apply higher-level thinking skills to familiar situations. However, students may have difficulty applying these skills in new or unfamiliar situations. For example, they can predict the effects of linking a familiar and identical electrical load in series or parallel, but they may have difficulty predicting the effects of linking different or unfamiliar types of electrical loads in these circuits. They can use basic skills to show what they know and can do to solve novel, real-life problems that are simple or that require single-step solutions. They can apply more advanced skills or follow multistep procedures to solve familiar real-life problems in which they have had prior experience. For example, in a problem-solving activity to find the best insulating material, these students will be able to develop a simple and controlled procedure, collect a set of data, and determine the best insulator. However, their procedures will likely not have more than one manipulated variable and may lack a complete and logical explanation of results.</p> <p>Students who meet the <i>acceptable standard</i> generally have a positive attitude toward learning about the world in which they live. They appreciate how science and technology affect them on a day-to-day basis. They are skilled in using the basic procedures of scientific inquiry, technological problem solving, and societal decision making; however, they may have difficulty with the application of more advanced skills and they may have limited ability to make connections between science, technology, and society.</p>	<p>Students who meet the <i>standard of excellence</i> in Grade 9 Science have an exceptional understanding of the conceptual and procedural knowledge outlined in the <i>Program of Studies</i>. They can quickly and confidently apply this knowledge in complex and novel situations. For example, not only can they identify the abiotic factors that affect the health and distribution of living things, but they can also predict the possible outcomes of changing abiotic factors on living things and evaluate their effects on the quality of the environment.</p> <p>These students are expected to be able to apply higher-level thinking skills to unfamiliar situations. In addition, they can easily and quickly solve problems that they have direct experience with and that require single-step or multistep solutions. These students can solve problems in more than one way and can see more than one solution for some problems. For example, not only are they familiar with the basic operation of an electric motor, but they can also troubleshoot an inoperative motor, make design changes to meet various performance criteria, and construct a working motor. Their problem-solving approach may involve more than one manipulated variable and include logical explanations of procedures and results.</p> <p>Students meeting the <i>standard of excellence</i> have a positive attitude about science and its role in the world. They are curious, open-minded, creative, and confident. In addition, they are persistent problem-solvers and have the ability to view a situation from a number of perspectives. Not only do they have a high level of awareness and understanding of how science and technology affect them personally, but they can also translate this understanding and awareness to societal issues. They are skilled in using the basic procedures of scientific inquiry, technological problem solving, and societal decision making. They can successfully use advanced skills and make connections between science, technology, and society.</p>

Blueprint

The blueprint for science shows the reporting categories under which questions are classified. The number of questions in each category is approximate.

Topic	Question Distribution by Reporting Category		Number and Proportion of Questions
	Knowledge	Skills	
Diversity of Living Things	4	6	10 (18%)
Fluids and Pressure	3	7	10 (19%)
Heat Energy: Transfer and Conservation	3	4	7 (13%)
Electromagnetic Systems	3	6	9 (16%)
Chemical Properties and Changes	3	6	9 (17%)
Environmental Quality	3	7	10 (17%)
Number and Proportion of Questions	19 (35%)	36 (65%)	55 (100%)

Preparing Students for the Science Test

Suggestions for Preparing Students

The best way to prepare students for writing the achievement tests is to teach the curriculum well and to ensure that children know what is expected. Many of the skills and attitudes that support test writing are, in fact, good skills and strategies for approaching all kinds of learning tasks.

Teachers are encouraged to familiarize their students with the types of questions that will appear on the test by discussing questions from achievement tests that are no longer secured. Then, have students share the strategies they used to answer the questions.

Teachers may also wish to share the following information with their students to help them prepare for the Grade 9 Science Achievement Test.

Suggestions for Answering Multiple-Choice and Numerical-Response Questions

- Before you begin, find out:
 - how much time you have
 - if you can use a calculator
- Ask questions if you are unsure of anything.
- Skim through the whole test before beginning. Find out how many questions there are and plan your time accordingly.
- Do not spend too much time on any one question. Make a mark (* or ?) beside questions that you wish to go back to.

- Read each question carefully, underline key words, and try to think of an answer before looking at the choices.
- Read all of the choices and see which one best fits the answer.
- When you are not sure which answer is correct, cross out any choices that are wrong, then pick the choice that is best.
- If you don't know the right answer, guess. Answer all questions—there is no penalty for guessing.
- If time permits, recheck your answers.
- Double check to make sure you have answered everything before handing in the test.
- Note that the questions on the science test are placed in real-life contexts and organized in narrative themes.
- Read the information given using the strategy that works best for you. You should either
 - look at all the information and think carefully about it before you try to answer the questions **OR**
 - read the questions first and then look at the information, keeping in mind the questions you need to answer
- Make sure you look at all forms of the information given. Information may be given in words, charts, pictures, graphs, or maps.
- When information is given for more than one question, go back to the information before answering each question.
- Check your work when you calculate an answer, even when your answer is one of the choices.

For further suggestions, see *Teaching Students with Learning Disabilities*, Alberta Learning, Special Programs Branch, pages LD 122 to 124.

ALL of the 2000 achievement tests are secured. The 1998 and the 1999 achievement tests are no longer secured and are posted on the Alberta Learning web site <http://ednet.edc.gov.ab.ca>.

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